IDAHO
DEPARTMENT OF FISH AND GAME

Jerry M. Conley, Director

OXBOW HATCHERY

Annual Report

1 October 1982 - 30 September 1983

by
Jim McLin
Fish Hatchery Superintendent I

November 1984

TABLE OF CONTENTS

LIST OF TABLES

Oxbow Hatchery

ABSTRACT

The 1982-83 fish year established a record for steelhead returning to Hells Canyon. A total of 872 adult A-strain steelhead were trapped in just 55 days in the fall of 1982. Steelhead spawning began in March of 1983. A total of 2,281,292 green steelhead eggs were taken from 444 females. When the eggs eyed, 748,256 were shipped to Niagara Springs and 868,039 were hatched at Oxbow. A total of 626,183 fry from Oxbow were released into the Little Salmon River. One hundred forty three adult steelhead were shipped to the Boise River from Oxbow. Only 16 adult spring chinook salmon were trapped this season.

Author:

Jim McLin
Hatchery Superintendent I

OBJECTIVES

The objectives of the Oxbow hatchery are to:

1. Trap all steelhead and salmon returning to Hells Canyon Dam.

2. Hold adult steelhead trout at Oxbow until they reach sexual maturity.

3. Transfer adult chinook salmon trapped at Hells Canyon to Rapid River hatchery for spawning and subsequent rearing.

4. Transfer eyed steelhead eggs to Niagara Springs hatchery for hatching and rearing.

5. Release all available salmon and steelhead smolts into the Snake River.

INTRODUCTION

The Oxbow Hatchery is on the Snake River's Hells Canyon Reservoir at Oxbow, Oregon. The hatchery is located one-half mile downstream from Idaho Power Company's Oxbow power plant. The fish trap is on the downstream face of Hells Canyon Dam on the Oregon shore of the Snake River, about 23 miles downstream from Oxbow.

Oxbow Hatchery is owned and financed by Idaho Power Company and is operated by the Idaho Department of Fish and Game.

Water for the hatchery is supplied by four pumps which draw water from Hells Canyon Reservoir. Two 480-volt pumps supply water at 7,850 gallons per minute to the holding ponds and raceways. Two smaller pumps supply the incubation system with 200 gallons per minute. Only one pump of each size is used for normal operation. The extra pumps are used as separately energized emergency systems in case of electrical or mechanical failure.

The fish holding facilities consist of four inter-connected ponds with automatic fish crowders, fish loading and unloading apparatus and adjacent fish sorting and spawning tanks and equipment. The four ponds can be operated as individual or joint units by using racks and stop logs. Two ponds are 34' x 54' x 8' and the other ponds are 34' x 104' x 8'. The normal operating depth is 4.5'. The ponds can safely hold about 4,000 adult steelhead or about 3,000 adult chinook. Water temperatures vary from 32° to 74°F.

The incubation system consists of a surge tank and two banks of distribution pipes with space for forty stacks of incubators. There are currently twelve 16-tray stacks of Heath incubators available for hatching about 2,500,000 eggs.

Oxbow 'Hatchery has six 100' x 6' x 3'raceways which are suitable for raising fry or fingerlings during the cool water months. A 360' incubation channel is not currently being used.

Buildings consist of a 12' x 60' mobile home with a tip-out living room and a 30' x 62' hatchery building. In addition, a 10' x 50' house trailer has been moved in to house the Brownlee Project temporary employees. The hatchery building houses the incubator room, a two man crew room, a small office and a shop.

The Oxbow Hatchery is currently operated on nearly a year around basis. Steelhead operations begin in September with the installation of the fish trap and watering of the holding ponds. The fish trap is left running until cold water temperatures or high water force its removal in December. The trap is reinstalled in the spring if water conditions permit. Trapped steelhead are transported from Hells Canyon to Oxbow and held there until spawning time in the spring.

Chinook salmon are normally trapped from late May through early July and held at Oxbow until there are sufficient numbers to be shipped to Rapid River for holding and subsequent spawning. Water temperatures are too high during the summer months to hold salmonids for any length of time.

Steelhead spawning operations normally begin in April and are not completed until the end of May. In recent years, spawning had started as early as the last two weeks of March.

FISH PRODUCTION

The 1982-83 fish year is the first season that steelhead fry have been raised at Oxbow. These fry were reared from 868,039 surplus eyed eggs from Hells Canyon stock. A total of 626,183 fry at 2,021 fish per pound or 309.75 pounds of fry were reared. Hatching success was 71.14%. An additional 1% mortality was experienced in rearing. The cost of food fed per pound of fish gained was $.318.

FISH HEALTH

Pre-spawning mortality for adult steelhead was 21 fish or 2.4% of the total trapped. An additional 26 fish (3.7%) died during the spawning process. Nearly all the pre-spawning mortality occurred within the first two weeks after trapping. The fish died from injuries associated with trapping and handling. Most mortalities during spawning were associated with secondary fungus infection caused by handling, nitrogen blisters or internal injury from jumping against the pond walls.

High water through the Hells Canyon Complex created some special problems for both the juvenile and adult fish. Spilling at Oxbow Dam started in late December and ended in July. As a result, all the fish were exposed to turbid, silty water and nitrogen super-saturation for prolonged periods. Chapman, (personnel communication), found nitrogen levels at the holding pond north inlet to be 118% of saturation. At least some of the nitrogen was removed by the blending system. Even then, 40% of the adults had nitrogen

blisters at spawning time. At least some of the spawning losses can be attributed to nitrogen blisters which became infected with fungus.

The adult fish were treated prophylactically with a one hour, four ppm malachite green flush three times weekly during the trapping season. These treatments seemed to prevent the heavy fungus infections experienced in the past. The same treatment was also used after each spawning day.

Oregon State University again checked the adult steelhead at Oxbow for viral infections. Ovarian fluid samples from 37 females were checked for IHN virus, but no IHN was found. The results of the test for IPN virus were not received.

All steelhead eggs were water hardened in Wescodyne this year to reduce or prevent vertical transmission of virus. The eggs were hardened in a 1:300 Wescodyne solution buffered with sodium bicarbonate for thirty minutes. The eggs were then rinsed and placed in incubators. A five percent loss of eggs may have been due to water hardening in Wescodyne.

Siltation in the incubators effected the eggs and caused some smothering losses in the fry. Hopefully a filter system will be installed in the incubation system to alleviate the siltation problems that plague Oxbow nearly every spring. Eye-up losses were 29.15% this year and hatching loss was 26.9%. Most of these losses were due to silt, as less than 1% of the fry had nitrogen bubbles. A 1:450,000 malachite green flush was successful in controlling fungus on the eggs.

Three spring chinook were lost due to injuries received in the trap. These problems should be eliminated with the new trap.

FISH TRANSFERS

Twelve spring chinook were transferred from Oxbow Hatchery to Rapid River Hatchery on July 20, 1983. These adult fish represent the total run of fish trapped. One male was released from a later trapping date.

FISH TRAPPING OPERATION

The 1982-83 fish year set records for the most steelhead trapped in a season at Oxbow and the most steelhead trapped in a day. There were 872 A-strain steelhead trapped at Hells Canyon between September 3, 1982, and October 28, 1982. The highest single day total was 95 fish during October. The Hells Canyon trap was removed on October 28, after 55 days of fishing, because sufficient numbers of steelhead had been caught for the egg needs and capacity of the hatchery (Table 1).

The trap was reinstalled for the spring chinook season on July 12. Unfortunately, the trap could not be installed at an earlier date because spilling at Hells Canyon caused too much turbulence. A disappointing total of 16 adult spring chinook salmon were trapped (Table 1).

Table 1. Fish trapping at Oxbow, 1982-83.

Month	Date Installed or Removed	Days in Operation	Numbe Steelhead	SpringChinook	Other
September 1982	9/3/82 Trap In	27 days	129	0	0
October	10/28/82 Trap Out	28 days	743	0	0
November	Not operating	0	0	0	0
December		0	0	0	0
January 1983		0	0	0	0
February		0	0	0	0
March	[11]	0	0	0	0
April		0	0	0	0
May		0	0	0	0
June		0	0	0	0
July	7/12/83 Trap In	19 days	2 (released)	16	1 (sockeye salmo`
August	8/01/83 Trap Out	1	0	0	0
Totals		75 days	874	16	1

Table 2. Fish released from Oxbow Hatchery.

FISH RELEASES

Date	Numbers	Pounds	Size	Location
November 1982	143	645	4.5 pounds/fish	Boise River
June 2, 1983	230,46	143.75	1,603	Hazard Creek (Little Salmon R.)
June 3, 1983	395,72	166.00	2,383 fish/pound	Boulder Creek (Little Salmon R.)

Oxbow Hatchery had two fish releases this season (Table 2). One hundred forty three adult steelhead were jaw tagged and released into the Boise River. This provided the people of Boise a rare opportunity to catch steelhead in their own back yard. The program was well received by both the public and the media. A high percentage of these fish were caught by fishermen.

Steelhead fry hatched from surplus Hells Canyon eggs were released into the Little Salmon River drainage at Hazard and Boulder creeks (Table 2). A total of 626,183 fry at 2,921 per pound or 309.75 pounds of fish were released.

Spawntaking operations began on March 23 and ended on April 28. The fish were sorted and spawned weekly. This year approximately 54% of the run were two-ocean fish (greater than 26.5" long, spending 2 seasons in the ocean). A total of 444 female A-strain steelhead and 195 males yielded 2,281,292 green eggs. There was an average of 5,138 eggs per female. Eye-up was 70.85%, or 1,616,295 eyed eggs. A total of 748,256 eyed eggs were transferred to Niagara Springs Hatchery, while 868,039 eggs were retained and hatched at Oxbow. Hatching percentage was 71.1%.

FISH FEED UTILIZED

One hundred fifty pounds of fish feed was utilized at Oxbow this year. Fifty pounds of #1 starter diet and 100 pounds of #2 fry diet were fed to the newly hatched fry. The cost per pound of fish fed was $.32.

HATCHERY IMPROVEMENTS

Both the inside and outside of the hatchery building were painted this year. Hatchery personnel painted the office, shop and crew room and stripped the old paint from the outside walls and roof. Idaho Power painted the exterior of the building. New bunk beds were purchased for the crew room.

Idaho Power Company rebuilt the main and standby pumps and raised the pump platform several feet. A new main pump has been ordered, since the old ones are badly worn. The pump platform was raised to protect the pumps from high water. The old pumps had to be shut down when river flows exceeded 80,000 cfs. The incubation pipe to the hatchery was replaced when the old one began to leak.

A new 10" PVC fish unloading pipe was installed by Idaho Power Company at the Hells Canyon Dam tailrace to facilitate fish releases. The new location is just downstream from the old pipe. The new pipe releases fish in a little less turbulent area.

The new fish trap at Hells Canyon should be complete by the next salmon season.

MISCELLANEOUS ACTIVITIES

Hatchery personnel gave a presentation to the Halfway Oregon Sportsmen's Club on the Hells Canyon anadromous program. Personnel also attended several regional meetings, participated in the physical fitness program and attended the superintendent's meeting.

The crew also assisted the Idaho Fish and Game's Brownlee Project during the summer. This project is a bass study on Brownlee Reservoir.

ACKNOWLEDGEMENTS

Oxbow Hatchery was staffed by:

Jim McLin, Fish Hatchery Superintendent I
Michael A. Graham, Fish Hatchery Superintendent I
Jeanne Wilmarth, Laborer.

A special thanks to those people assisting with fish spawning, including the Brownlee Project crew, the Niagara Springs crew and the Oregon State Police.